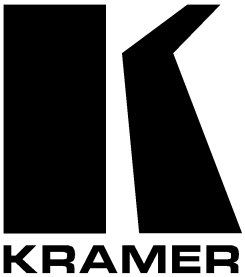
Kramer Electronics, Ltd.



USER MANUAL

Model:

TP-43

Component – S/PDIF Transceiver

Contents

1	**Introduction**	**1**
2	**Getting Started**	**1**
3	**Overview**	**1**
3.1	Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)	2
3.2	About the TP-43	2
3.3	Recommendations for Achieving the Best Performance	3
4	**Your TP-43 Component – S/PDIF Transceiver**	**3**
4.1	Your TP-43 Component – S/PDIF Transceiver Topside	3
4.2	Your TP-43 Component – S/PDIF Transceiver Underside	5
5	**Connecting the TP-43 Component – S/PDIF Transceiver**	**6**
5.1	Connecting a TP-43 Component – S/PDIF Transceiver	6
5.2	Connecting an Extended Component – S/PDIF Distribution System	8
5.3	Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors	10
6	**Technical Specifications**	**11**

Figures

Figure 1: TP-43 Component – S/PDIF Transceiver 3
Figure 2: TP-43 Component – S/PDIF Transceiver Top Side 4
Figure 3: TP-43 Component – S/PDIF Transceiver Lower Side 4
Figure 4: TP-43 Component – S/PDIF Transceiver Underside 5
Figure 5: Connecting the TP-43 Component – S/PDIF Transceiver 7
Figure 6: Configuring an Extended Component – S/PDIF Distribution System 9
Figure 7: CAT 5 PINOUT 10

Tables

Table 1: TP-43 Component – S/PDIF Transceiver Features 4
Table 2: TP-43 Component – S/PDIF Transceiver Underside Features 5
Table 3: CAT 5 PINOUT 10
Table 4: Technical Specifications of the TP-43 11

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **TP-43** *Component – S/PDIF Transceiver*, which is designed to be used with the **TP-41** *Component – S/PDIF transmitter* and the **TP-42** *Component – S/PDIF receiver*. The **TP-43** is also suitable for utilizing existing UTP cabling that results in an efficient, fast and uncluttered environment for:

- High quality home cinema at multiple outputs
- Studios, airports, offices and hospitals
- Security and military applications

The package includes the following items:

- **TP-43**, a power supply[2] and this user manual[3]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[4]

3 Overview

This section describes:

- Using shielded twisted pair (STP)/unshielded twisted pair (UTP), see section 3.1
- A summary of the **TP-43**, see section 3.2
- Recommendations for achieving the best performance, see section 3.3

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 The TP-43 does not have the power connect feature

3 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

4 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

3.1 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

The decision whether to use shielded twisted pair (STP) cable or unshielded twisted pair (UTP) cable depends on the nature of the application.

It is recommended that in applications with high interference, shielded twisted pair (STP) cable will give better results. However, the shield itself does create a capacitance that degrades the frequency response of the machines. For shorter distances, of 50m or so, shielded twisted pair (STP) cable is preferred because it provides protection from interference (degradation is non apparent).

For a long range application, unshielded twisted pair (UTP) cable is preferred. However, the unshielded twisted pair (UTP) cable should be installed far away from electric cables, motors etc., which are prone to create electrical interference.

Some Kramer twisted pair products include the Power Connect feature[1]. The **TP-43** does not have this feature.

3.2 About the TP-43

The **TP-43** *Component – S/PDIF Transceiver* receives the CAT5 signal, decodes it and simultaneously distributes it to the YUV and S/PDIF outputs, as well as relaying the input to the next receiver (transceiver operation). In particular, the **TP-43** *Component – S/PDIF Transceiver* features:

- A YUV[2] output on 3 RCA connectors
- A digital audio output (S/PDIF) on an RCA connector
- A CAT5 input and output on RJ-45 connectors
- Individual level and EQ. controls for the Y, U, and V signals, as well as audio level and EQ. controls

The **TP-43** *Component – S/PDIF Transceiver* is designed to be used with the **TP-41** and the **TP-42**. When using three **TP-43** units between the **TP-41 / TP-42** pair, the maximum range of the system via UTP cabling can be extended to up to 1200ft (400m).

Kramer twisted pair adapters are an excellent way to solve remote monitoring requirements without using more costly coaxial cable or fiber, or wireless transmission systems.

---

1 The Power Connect feature lets you power a transmitter / receiver system by connecting just one power adapter to either the transmitter or the receiver. The other unit is fed over the same CAT5 cable. The Power Connect feature applies as long as the CAT5 cable is heavy gauge cable (that is, it can carry power). The distance does not exceed 50 meters on standard cable. For a distance of 100 meters, separate power supplies must be connected to the transmitter and to the receiver simultaneously, unless using heavy gauge CAT5 cable

2 Also known as Y, B-Y, R-Y, or Y, Pb, Pr

3.3 Recommendations for Achieving the Best Performance

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality, and positioning your **TP-43** away from moisture, excessive sunlight and dust

4 Your TP-43 Component – S/PDIF Transceiver

For a description of the **TP-43** *Component – S/PDIF Transceiver*:

- Topside, see section 4.1
- Underside, see section 4.2

4.1 Your TP-43 Component – S/PDIF Transceiver Topside

Figure 1, Figure 2, Figure 3, and Table 1 define the topside of the **TP-43**:

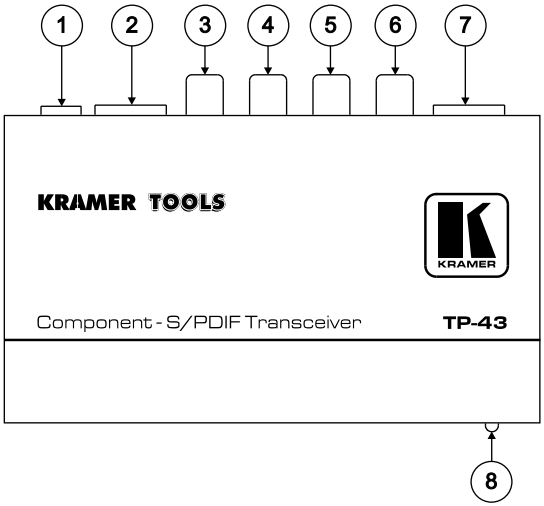


Figure 1: TP-43 Component – S/PDIF Transceiver

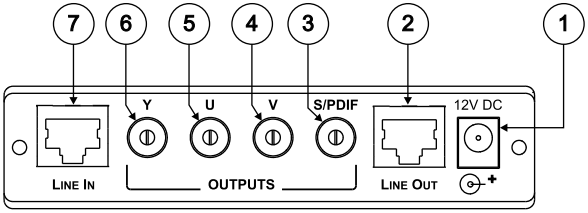


Figure 2: TP-43 Component – S/PDIF Transceiver Top Side

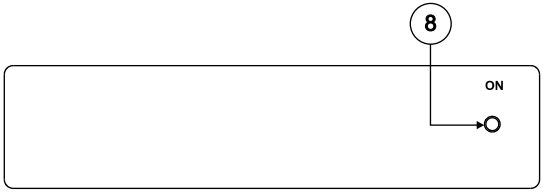


Figure 3: TP-43 Component – S/PDIF Transceiver Lower Side

Table 1: TP-43 Component – S/PDIF Transceiver Features

#	Feature		Function
1	*12V DC*		+12V DC connector for powering the unit
2	*LINE OUT* RJ-45 Connector		Connects to the *LINE IN* connector on the **TP-42**[1]
3	OUTPUTS	*S/PDIF* RCA Connector	Connects to the digital audio acceptor
4		*V* RCA Connector	Connects to the component video acceptor
5		*U* RCA Connector	
6		*Y* RCA Connector	
7	*LINE IN* RJ-45 Connector		Connects to the *LINE OUT* connector on the **TP-41**[1]
8	*ON LED*		Illuminates when receiving power

1 Using a straight pin to pin UTP or STP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 3 and Figure 7)

4.2 Your TP-43 Component – S/PDIF Transceiver Underside

Figure 4 and Table 2 define the underside of the **TP-43**:

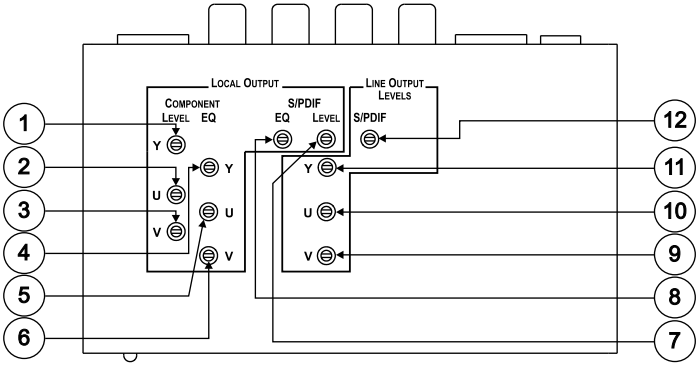


Figure 4: TP-43 Component – S/PDIF Transceiver Underside

Table 2: TP-43 Component – S/PDIF Transceiver Underside Features

#	Feature				Function
1	LOCAL OUTPUT	COMPONENT	LEVEL	Y Trimmer	Adjusts[1] the Y output signal level
2				U Trimmer	Adjusts[1] the U output signal level
3				V Trimmer	Adjusts[1] the V output signal level
4			EQ.	Y Trimmer	Adjusts[1] the cable compensation equalization level for output Y
5				U Trimmer	Adjusts[1] the cable compensation equalization level for output U
6				V Trimmer	Adjusts[1] the cable compensation equalization level for output V
7		S/PDIF	LEVEL		Adjusts[1] the digital audio signal level
8			EQ.		Adjusts[1] the digital audio output cable compensation equalization level
9	LINE OUTPUT LEVELS		V Trimmer		Adjusts[1] the V line output signal level
10			U Trimmer		Adjusts[1] the U line output signal level
11			Y Trimmer		Adjusts[1] the Y line output signal level
12			S/PDIF Trimmer		Adjusts[1] the S/PDIF digital audio line output signal level

1 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

5 Connecting the TP-43 Component – S/PDIF Transceiver

This section describes how to connect:

- The **TP-43**, see section 4.1
- An extended Component – S/PDIF distribution system by connecting three **TP-43** units between the **TP-41** and the **TP-42**, see section 4.2

5.1 Connecting a TP-43 Component – S/PDIF Transceiver

To configure a **TP-43** *Component – S/PDIF Transceiver*, as the example in Figure 5 illustrates, do the following:

1. Connect the:
   - Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display)
   - S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
2. Connect the *LINE IN* connector of the **TP-43** to the *LINE OUT* connector of the **TP-41**, via UTP cabling (maximum range of 300ft (100m)).
3. Connect the *LINE OUT* connector of the **TP-43** to the *LINE IN* connector of the **TP-42**, via UTP cabling (maximum range of 300ft (100m)).
4. Connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 5).
5. If necessary, adjust[1] the appropriate level(s) of the **TP-43**, the:
   - Local output: Y, U and V signal levels, Y, U and V compensation equalization levels, and the digital audio S/PDIF level and compensation equalization level
   - Line output: Y, U and V signal levels, and the digital audio S/PDIF level

1 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

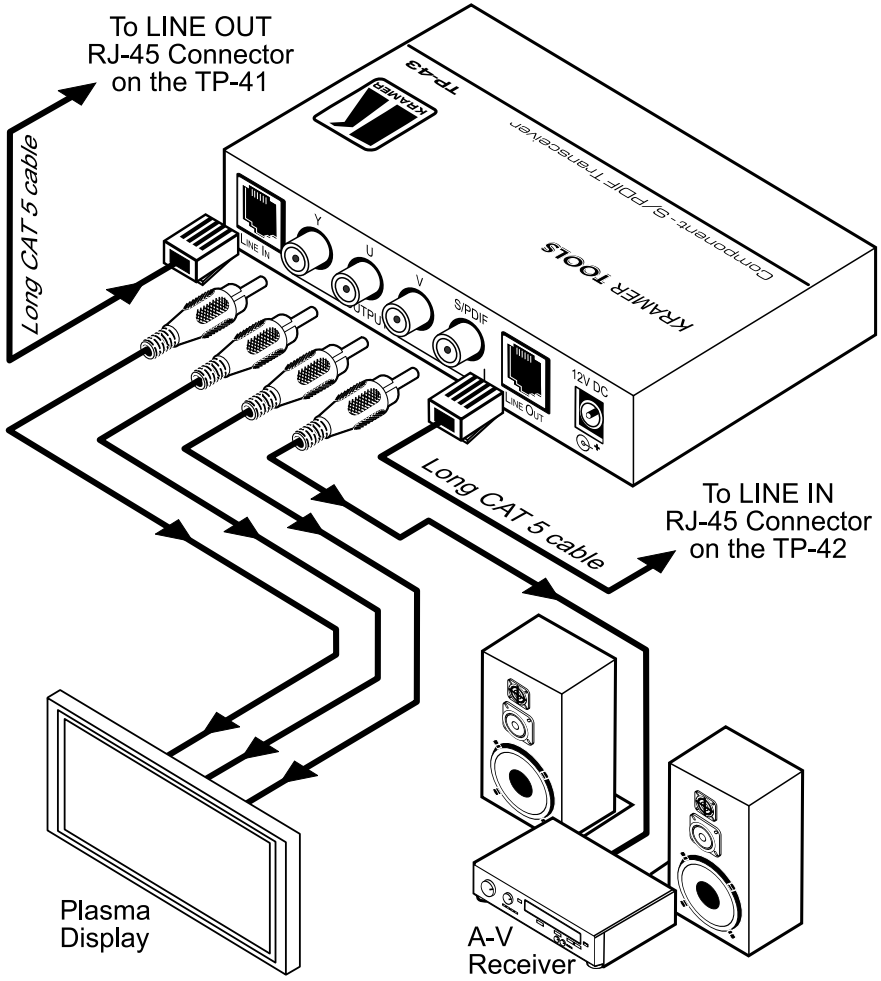


Figure 5: Connecting the TP-43 Component – S/PDIF Transceiver

5.2 Connecting an Extended Component – S/PDIF Distribution System

To configure a **TP-41 / TP-42 / TP-43** extended Component – S/PDIF distribution system (up to 1200ft (400m)), as the example in Figure 6 illustrates:

1. On the **TP-41**, connect the:
   - Y, U, and V RCA INPUT connectors and the S/PDIF (digital audio) RCA INPUT connector to a component source (for example, a DVD player)
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the first **TP-43**
2. On the first **TP-43**, connect the:
   - Local Output A: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the second **TP-43**
3. On the second **TP-43**, connect the:
   - Local Output B: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the third **TP-43**
4. On the third **TP-43**, connect the:
   - Local Output C: Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
   - *LINE OUT* connector[1] to the *LINE IN* connector[1] of the **TP-42**
5. On the **TP-42**, connect the:
   - Y, U, and V RCA (component video) OUTPUT connectors to a component acceptor (for example, a plasma display), and the S/PDIF (digital audio) RCA OUTPUT connector to an AV Receiver
6. On each unit, connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 6).
7. If necessary, adjust[2] the appropriate level(s) on the **TP-41**[3], the **TP-42**[4] and on each of the three **TP-43** units[5].

1 Via CAT5 cabling with a maximum range of up to 300ft (100m)

2 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

3 That is, the audio level and the Y, U, and V levels

4 That is, the audio level, the audio EQ., the Y, U, and V levels, and the Y, U, and V EQ.

5 That is, the local output: Y, U and V signal levels / compensation equalization levels, and the digital audio S/PDIF level and compensation equalization level, as well as the line output: Y, U and V signal levels, and the digital audio S/PDIF level

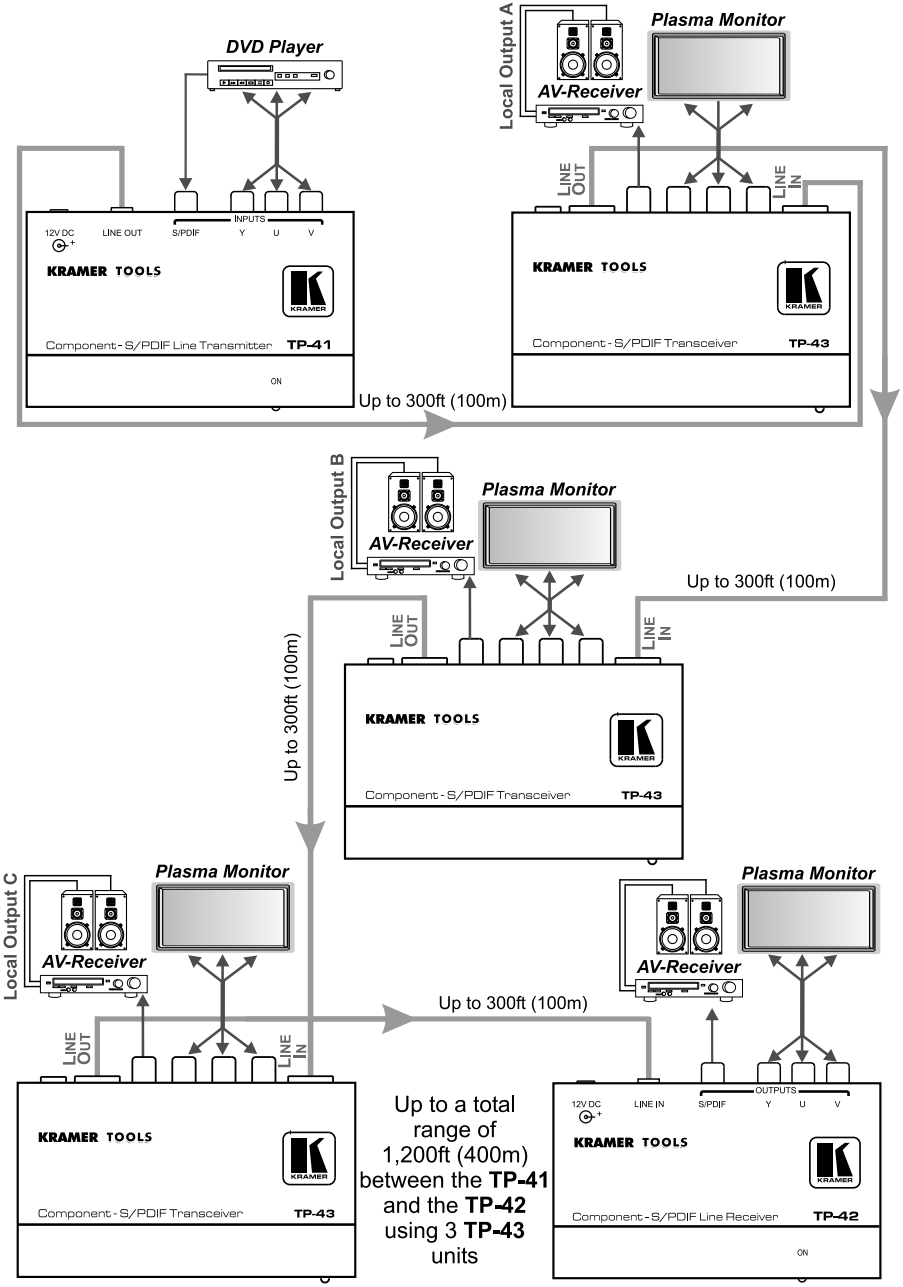


Figure 6: Configuring an Extended Component – S/PDIF Distribution System

5.3 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

Table 3 and Figure 7 define the CAT 5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Figure 7: CAT 5 PINOUT

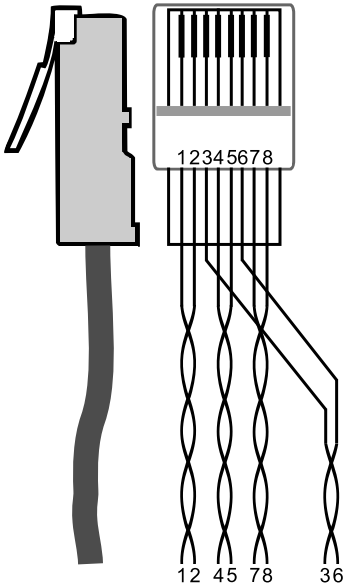


Table 3: CAT 5 PINOUT

EIA /TIA 568A	
PIN	**Wire Color**
1	Green / White
2	Green
3	Orange / White
4	Blue
5	Blue / White
6	Orange
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	3 and 6
Pair 3	1 and 2
Pair 4	7 and 8

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

6 Technical Specifications

Table 4 defines the technical specifications[1]:

Table 4: Technical Specifications[2] of the TP-43

INPUTS:	1 RJ-45 CAT-5 shielded connector (LINE IN)	
OUTPUTS:	Local Output	1 set of component video (Y, U, V) on RCA connectors 1 S/PDIF (digital audio) on an RCA connector
	Repeater Line Output	1 RJ-45 CAT-5 shielded connector (LINE OUT)
MAX. OUTPUT LEVEL:	2Vpp[3]	
RESOLUTION:	VIDEO: Up to 1080i	AUDIO: S/PDIF up to 192kHz
DIFF. GAIN:	0.15%	
DIFF. PHASE:	1.05 Deg[4] / 0.68 Deg[5]	
K-FACTOR:	0.1%	
S/N RATIO:	VIDEO: 72dB	
CROSSTALK (all hostile):		AUDIO: –46dB S/PDIF into video@5MHz
CONTROLS:	Video Line Out Level: –1.1dB to +1.4dB Video Level Out: –0.9dB to +0.83dB S/PDIF Line Out Level: –1.6dB to +0.9dB S/PDIF Level Out: –0.82dB to +0.8dB EQ. at TP 43 OUT: 0 to +4.1dB video @ 33MHz 0 to +3dB S/PDIF @ 33MHz (60m)	
COUPLING:	VIDEO: DC	AUDIO: DC
POWER SOURCE:	12VDC, 139mA	
DIMENSIONS:	12cm x 7.15cm x 2.76cm (4.7" x 2.8" x 1.08"), W, D, H	
WEIGHT:	0.3 kg (0.67 lbs.) approx	
ACCESSORIES:	Power Supply	

1 Specifications for CAT5 UTP cable 60m (TP-41 to TP-43) and 30m (TP-43 to TP-42), unless otherwise specified

2 Specifications are subject to change without notice

3 For video and audio

4 Repeater section

5 Local output

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.
NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.
This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: “Radio frequency devices Subpart B – Unintentional radiators”

CAUTION!

- ⌦ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ⌦ Use the supplied DC power supply to feed power to the machine.
- ⌦ Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000136 REV 1